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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/692,671	10/24/2003	Tibor Boros	15685P023DC	9975

8791 7590 02/20/2007  
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EXAMINER
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PHUONG, DAI

ART UNIT	PAPER NUMBER
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2617

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/20/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/692,671

Applicant(s)

BOROS ET AL.

Examiner

Dai A. Phuong

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 November 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 9-13 and 15-75 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 9-13 and 15-75 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

**DETAILED ACTION.**

***Response to Amendment***

1. Applicant's arguments, filed 11/22/2006, with respect to claims have been considered but are moot in view of the new ground(s) of rejection. Claim 1-8 and 14 had been canceled. Claims 9-13 and 15-75 are currently pending.

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 9-12, 15-19, 21-70 and 72-75 are rejected under 35 U.S.C. 102(b) as being anticipated by Mazur et al. (U.S. 6072792).

**It is noted, with respect to claims 9-13, 15-16, 28-46 and 58--69 that the language used by Applicant merely suggests or makes optional those feature described as "operate" such language does not require steps to be performed or limits the claim to a particular structure.**

**Operable:**

The manner of operating the device does not differentiate apparatus claim from the prior art. -MPEP 2114.

Regarding claim 9, Mazur et al. disclose a communications device comprising:

a transmitter coupled to an antenna array, the antenna array comprising a plurality of antenna elements (fig. 2, col. 6, line 30 to col. 7, line 55), the transmitter operable to transmit a calibration burst (fig. 6, col. 4, lines 4-44).

transmitting a first waveform from a first antenna element of the plurality of antenna elements, the first waveform comprising a combined signal that is a combination of two or more signals (fig. 1 to fig. 8, col. 5, line 44 to col. 11, line 10); and

transmitting a second waveform from second antenna elements of the plurality of antenna elements, the second waveform comprising a combined signal each transmitted from an antenna element of the two or more antenna elements corresponding to each signal (fig. 1 to fig. 8, col. 5, line 44 to col. 11, line 10).

Regarding claim 10, Mazur et al. disclose all the limitation in claim 9. Further, Mazur et al. disclose the communications device wherein the first antenna element is one of the two or more antenna elements (fig. 2, col. 6, line 30 to col. 7, line 55).

Regarding claim 11, Mazur et al. disclose all the limitation in claim 9. Further, Mazur et al. disclose the communications device wherein the second waveform comprises a sum of the two or more signals (fig. 1 to fig. 8, col. 5, line 44 to col. 11, line 10).

Regarding claim 12, Mazur et al. disclose all the limitation in claim 9. Further, Mazur et al. disclose the communications device wherein the communications device comprises a base station of a radio communications network (fig. 1 to fig. 8, col. 5, line 44 to col. 11, line 10)).

Regarding claim 15, Mazur et al. disclose all the limitation in claim 9. Further, Mazur et al. disclose the communications device wherein the first antenna element comprises a reference

element with respect to which the other antenna elements are calibrated (fig. 1 to fig. 8, col. 5, line 44 to col. 11, line 10).

Regarding claim 16, Mazur et al. disclose all the limitation in claim 9. Further, Mazur et al. disclose the communications device wherein the communication device comprises a subscriber unit (fig. 1 to fig. 8, col. 5, line 44 to col. 11, line 10).

Regarding claim 17, this claim is rejected for the same reason as set forth in claim 9.

Regarding claim 18, this claim is rejected for the same reason as set forth in claim 10.

Regarding claim 19, this claim is rejected for the same reason as set forth in claim 11.

Regarding claim 21, this claim is rejected for the same reason as set forth in claim 15.

Regarding claim 22, Mazur et al. disclose a method comprising: transmitting from a subscriber unit a first waveform from a first antenna element of a plurality of antenna elements coupled to the subscriber unit, the first waveform comprising a combined signal that is a combination of two or more signals (fig. 1 to fig. 8, col. 5, line 44 to col. 11, line 10); and

transmitting from the subscriber unit a second waveform from two or more antenna elements of the plurality of antenna elements, the second waveform comprising the two or more signals each transmitted from an antenna element of the two or more antenna elements corresponding to each signal (fig. 1 to fig. 8, col. 5, line 44 to col. 11, line 10);

wherein the subscriber unit is coupled to an antenna array, the antennas array comprising the plurality of antenna elements (fig. 1 to fig. 8, col. 5, line 44 to col. 11, line 10).

Regarding claim 23, Mazur et al. disclose all the limitations in claim 22. Further, Mazur et al. disclose the method wherein the subscriber unit is a radio transceiver remote to an array-

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equipped transceiver and transmits the first and second waveforms to the array-equipped transceiver (fig. 1 to fig. 8, col. 5, line 44 to col. 11, line 10).

Regarding claim 24, this claim is rejected for the same reason as set forth in claim 10.

Regarding claim 25, this claim is rejected for the same reason as set forth in claim 11.

Regarding claim 26, this claim is rejected for the same reason as set forth in claim 13.

Regarding claim 27, this claim is rejected for the same reason as set forth in claim 15.

Regarding claim 28, Mazur et al. disclose a communications device comprising:

A transmitter coupled to an antenna array, the antenna array comprising a plurality of antenna elements (fig. 2, col. 6, line 30 to col. 7, line 55), the transmitter operable to:

transmit a first data signal and a first calibration signal from a first antenna element of the plurality of antenna elements (fig. 1 to fig. 8, col. 5, line 44 to col. 11, line 10);  
and

transmit a second data signal and a second calibration signal from at least one other antenna element in the plurality of elements (fig. 1 to fig. 8, col. 5, line 44 to col. 11, line 10).

Regarding claim 29, Mazur et al. disclose all the limitations in claim 28. Further, Mazur et al. disclose the communication device wherein the first and second data signals are identical (fig. 1 to fig. 8, col. 5, line 44 to col. 11, line 10) and the first and second calibration signals are identical (fig. 1 to fig. 8, col. 5, line 44 to col. 11, line 10).

Regarding claim 30, Mazur et al. disclose all the limitations in claim 28. Further, Mazur et al. disclose the communication device wherein the first and second data signals are different

(fig. 1 to fig. 8, col. 5, line 44 to col. 11, line 10), and the first and second calibration signals are identical (fig. 1 to fig. 8, col. 5, line 44 to col. 11, line 10).

Regarding claim 31, Mazur et al. disclose all the limitations in claim 28. Further, Mazur et al. disclose the communication device wherein the first and second data signals are identical (fig. 1 to fig. 8, col. 5, line 44 to col. 11, line 10), and the first and second calibration signals are different (fig. 1 to fig. 8, col. 5, line 44 to col. 11, line 10).

Regarding claim 32, Mazur et al. disclose all the limitations in claim 28. Further, Mazur et al. disclose the communication device wherein the first and second data signals are different (fig. 1 to fig. 8, col. 5, line 44 to col. 11, line 10), and the first and second data it and second calibration signals are different (fig. 1 to fig. 8, col. 5, line 44 to col. 11, line 10).

Regarding claim 33, Mazur et al. disclose all the limitations in claim 28. Further, Mazur et al. disclose the communication device wherein the transmitter transmits the first data signal and the first calibration signal in a time period that overlaps a time period for transmitting the second data signal and the second calibration signal (fig. 1 to fig. 8, col. 5, line 44 to col. 11, line 10).

Regarding claim 34, this claim is rejected for the same reason as set forth in claim 29.

Regarding claim 35, this claim is rejected for the same reason as set forth in claim 30.

Regarding claim 36, this claim is rejected for the same reason as set forth in claim 31.

Regarding claim 37, this claim is rejected for the same reason as set forth in claim 32.

Regarding claim 38, this claim is rejected for the same reason as set forth in claim 33.

Regarding claim 39, this claim is rejected for the same reason as set forth in claim 29.

Regarding claim 40, this claim is rejected for the same reason as set forth in claim 30.

Regarding claim 41, this claim is rejected for the same reason as set forth in claim 31.

Regarding claim 42, this claim is rejected for the same reason as set forth in claim 32.

Regarding claim 43, Mazur et al. disclose all the limitations in claim 28. Further, Mazur et al. disclose the communication device wherein the communications device is a subscriber device (fig. 1 to fig. 8, col. 5, line 44 to col. 11, line 10).

Regarding claim 44, Mazur et al. disclose all the limitations in claim 28. Further, Mazur et al. disclose the communication device wherein the communications device is a base (fig. 1 to fig. 8, col. 5, line 44 to col. 11, line 10).

Regarding claim 45, Mazur et al. disclose all the limitations in claim 28. Further, Mazur et al. disclose the communication device further comprising a receiver operable to receive information processed at a remote transceiver wherein the received information is derived from the transmitted first and second calibration signals (fig. 1 to fig. 8, col. 5, line 44 to col. 11, line 10).

Regarding claim 46, Mazur et al. disclose all the limitations in claim 28. Further, Mazur et al. disclose the communication device wherein the first and second data signals are transmitted on at least one traffic channel and the first and second calibration signals are transmitted on at least one of: at least one traffic channel and at least one calibration channel (fig. 1 to fig. 8, col. 5, line 44 to col. 11, line 10).

Regarding claim 47, this claim is rejected for the same reason as set forth in claim 28.

Regarding claim 48, this claim is rejected for the same reason as set forth in claim 29.

Regarding claim 49, this claim is rejected for the same reason as set forth in claim 30.

Regarding claim 50, this claim is rejected for the same reason as set forth in claim 31.

Regarding claim 51, this claim is rejected for the same reason as set forth in claim 32.



Regarding claim 52, this claim is rejected for the same reason as set forth in claim 33.

Regarding claim 53, this claim is rejected for the same reason as set forth in claim 33.

Regarding claim 54, Mazur et al. disclose all the limitations in claim 47. Further, Mazur et al. disclose the method further comprising: receiving the transmitted first and second calibration signals; at a remote device and in response processing the calibration signals (fig. 1 to fig. 8, col. 5, line 44 to col. 11, line 10).

Regarding claim 55, Mazur et al. disclose all the limitations in claim 54. Further, Mazur et al. disclose the method further comprising transmitting the processed calibration signals to another device (fig. 1 to fig. 8, col. 5, line 44 to col. 11, line 10).

Regarding claim 56, Mazur et al. disclose all the limitations in claim 54. Further, Mazur et al. disclose the method of first and second calibration signals to enable the reception of the first and second data (fig. 1 to fig. 8, col. 5, line 44 to col. 11, line 10).

Regarding claim 57, Mazur et al. disclose all the limitations in claim 28. Further, Mazur et al. disclose the method wherein the first and second data signals are transmitted on at least one traffic channel and the first and second calibration signals are transmitted on at least one of: at least one traffic channel and at least one calibration channel (fig. 1 to fig. 8, col. 5, line 44 to col. 11, line 10).

Regarding claim 58, this claim is rejected for the same reason as set forth in claim 28.

Regarding claim 59, this claim is rejected for the same reason as set forth in claim 29.

Regarding claim 60, this claim is rejected for the same reason as set forth in claim 30.

Regarding claim 61, this claim is rejected for the same reason as set forth in claim 31.

Regarding claim 62, this claim is rejected for the same reason as set forth in claim 32.

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Regarding claim 63, this claim is rejected for the same reason as set forth in claim 33.

Regarding claim 64, this claim is rejected for the same reason as set forth in claim 33.

Regarding claim 65, Mazur et al. disclose all the limitations in claim 58. Further, Mazur et al. disclose the communication device further operable to process the calibration signals (fig. 1 to fig. 8, col. 5, line 44 to col. 11, line 10).

Regarding claim 66, Mazur et al. disclose all the limitations in claim 58. Further, Mazur et al. disclose the communication device operable to use the results of processing the first and second calibration signals <sup>device.</sup> to enable the reception of the first and second data signals (fig. 1 to fig. 8, col. 5, line 44 to col. 11, line 10).

Regarding claim 67, Mazur et al. disclose all the limitations in claim 65. Further, Mazur et al. disclose the communication device operable to transmit the processed calibration signals to another (fig. 1 to fig. 8, col. 5, line 44 to col. 11, line 10).

Regarding claim 68, Mazur et al. disclose all the limitations in claim 58. Further, Mazur et al. disclose the communication device further comprising: an antenna array viable to receive the first data signal, the first calibration and the second calibration signal (fig. 1 to fig. 8, col. 5, line 44 to col. 11, line 10).

Regarding claim 69, Mazur et al. disclose all the limitations in claim 58. Further, Mazur et al. disclose the communication device wherein the first and second data signals are transmitted on at least one traffic channel and the first and second calibration signals are transmitted on at least one of at least one traffic channel and at least one calibration channel (fig. 1 to fig. 8, col. 5, line 44 to col. 11, line 10).

Regarding claim 70, Mazur et al. disclose a method comprising: receiving a burst on a traffic channel of an air-interface protocol (col. 5, line 44 to col. 8, line 44); and extracting from the received burst at least a calibration burst (col. 5, line 44 to col. 8, line 44).

Regarding claim 72, Mazur et al. disclose all the limitations in claim 70. Further, Mazur et al. disclose the method wherein the method is performed by a subscriber unit (col. 5, line 44 to col. 8, line 44).

Regarding claim 73, Mazur et al. disclose all the limitations in claim 70. Further, Mazur et al. disclose the method wherein the method is performed by a base station (col. 5, line 44 to col. 8, line 44).

Regarding claim 74, Mazur et al. disclose a method comprising: inserting a calibration signal into a traffic signal (col. 5, line 44 to col. 8, line 44); and transmitting the traffic signal on a traffic channel of an air-interface protocol (col. 5, line 44 to col. 8, line 44).

Regarding claim 75, Mazur et al. disclose all the limitations in claim 74. Further, Mazur et al. disclose the communication device wherein the method is performed by a subscriber unit or a base station (col. 5, line 44 to col. 8, line 44).

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title; if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 13 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mazur et al. (U.S. 6072792) in view of Miya et al. (Pub. No: 2003/0186725).

Regarding claim 13, Mazur et al. disclose all the limitation in claim 12. However, Mazur et al. do not disclose communications device wherein the calibration burst is transmitted to a user terminal of the radio communications network, the user terminal being operable to use the calibration burst to assist in calibrating the base station.

In the same field of endeavor, Miya et al. disclose communications device wherein the calibration burst is transmitted to a user terminal of the radio communications network, the user terminal being operable to use the calibration burst to assist in calibrating the base station ([0021] to [0023] and [0065]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the multi-channel digital transmitter of Mazur et al. by specifically including the calibration burst is transmitted to a user terminal of the radio communications network, the user terminal being operable to use the calibration burst to assist in calibrating the base station, as taught by Miya et al., the motivation being in order to provide a calibration system for the array antenna radio communication apparatus capable of accurately detecting the delay characteristic and amplitude characteristic at the radio reception units.

Regarding claim 20, this claim is rejected for the same reason as set forth in claim 13.

6. Claim 71 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mazur et al. (U.S. 6072792) in view of Barrat et al. (U.S. 5592490)

Regarding claim 71, Mazur et al. disclose all the limitations in claim 70. However, Mazur et al. do not disclose the communication device further comprising calculating a spatial signature related measurement using the calibration burst (col. 10, line 35 to col. 11, line 42).

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In the same field of endeavor, Barrat et al. disclose the communication device further comprising calculating a spatial signature related measurement using the calibration burst.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the multi-channel digital transmitter of Mazur et al. by specifically including disclose the communication device further comprising calculating a spatial signature related measurement using the calibration burst, as taught by Barrat et al., the motivation being in order to transmit spatially multiplexed downlink signals. The result is a dramatic increase in spectral efficiency, capacity, signal quality, and coverage of wireless communication systems.

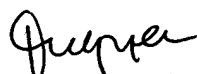
### Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dai A Phuong whose telephone number is 571-272-7896. The examiner can normally be reached on Monday to Friday, 9:00 A.M. to 5:00 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nguyen M Duc can be reached on 571-272-7503. The fax phone number for the organization where this application or proceeding is assigned is 571-273-7503.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Dai Phuong  
AU: 2617  
Date: 02/09/2007

  
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